

7/23/02

**NATIONAL TRANSPORTATION SAFETY BOARD**  
**Office of Marine Safety**  
**Washington, D.C. 20594**

**Survival Factors Group Chairman's**  
**Factual Report**

Revised 7/9/2002  
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## **A. ACCIDENT**

**U.S. Navy/ USS *Greeneville* (SSN772)**

Ehime Prefecture/ *Ehime Maru*

Location: Nine miles South of Diamond Head, Honolulu, HI

Date: February 9, 2001

Time: 1343

NTSB No.: DCA01MM022

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## C. SUMMARY

While surfacing at about 1343W (local time), the submarine *USS Greeneville* collided with the fishing/training vessel *Ehime Maru*. The *Ehime Maru* sank six minutes after the collision. 26 of the 35 personnel on the *Ehime Maru* successfully abandoned ship and entered life rafts. Coast Guard boats recovered these survivors about one hour after the collision. Bodies of eight of the nine missing personnel were recovered during salvage operations in October, 2001. One student remains missing.

## D. DETAILS OF THE INVESTIGATION

### Survival Factors Group Interviews

2/11/01	9 students from the <i>Ehime Maru</i> (Summary attachment 6)
2/12/01	6 <i>Ehime Maru</i> crewmen: Captain Chief Officer 2 <sup>nd</sup> Officer 2 <sup>nd</sup> Engineer Two seamen on the bridge at time of collision. (Summary attachment 7)
2/13/01	1 injured <i>Ehime Maru</i> crewman No. 1 Oiler High School Principle Prefecture Government Representative

2/14/01	Coast Guard personnel Commanding Officer, Independent Support Command (ISC) Commander, Group Honolulu C-130 aircraft commander RHI Coxswain/Officer-in-Charge, Station Honolulu 41' Coxswain/Executive Petty Officer, Station Honolulu 3 personnel at ISC
2/15/01	Navy Personnel Commanding Officer, NSSC (Navy Support Command) Officer-in-Charge, TWR's (Torpedo recovery boats) (Each was on board one of the first responding TWR's)  Coast Guard Personnel Chief, Search and Rescue, 14 <sup>th</sup> District Senior JRCC Controller, 14 <sup>th</sup> District Coast Guard Duty Controller (JRCC)(LT) Air Force Duty Controller (JRCC)(E-6)
2/16/01	Coast Guard Personnel H65 Aircraft Commander H65 Rescue Swimmer Group Duty Officer, Group Honolulu Communications Watch stander, Group Honolulu American Red Cross Supervisor
2/17/01	Navy Personnel Diving Officer/asst deck supervisor
2/18/01	Navy Personnel COMSUBPAC Deputy Chief of Staff-Operations (CAPT Winney)  COMSUBPAC Operations Officer (CDR Bayley) COMSUBPAC Opscen Watch stander (LT) COMSUBPAC Opscen duty QMOW (E-6) Acting COMSUBPAC (Capt Kyle) Bridge OOD, USS Greeneville Lookout, USS Greeneville
2/20/01	Honolulu Emergency Medical Services Division Chief, EMS Division, Honolulu Assistant Chief, Operations, EMS Field Operations Supervisor

2/21/01      Navy Personnel  
                 Chief of the Boat, USS Greeneville  
                 Senior Diver, USS Greeneville  
                 Diver, USS Greeneville

2/22/01      Harbor Pilot that took Ehime Maru out of Honolulu on 2/9/01

### **Vessel Descriptions as pertains to Survival Factors**

a. The *Ehime Maru* was a 191-foot training fishing vessel. Its manned spaces were distributed on three decks plus the pilothouse. Attachment 1 is a series of drawings of the *Ehime Maru*. The majority of the living spaces were on the 2<sup>nd</sup> deck. There were two fore/aft parallel passageways in this area, with ladders to the 1<sup>st</sup> deck at each end of passageways. The 3<sup>rd</sup> deck habitable spaces consisted primarily of a student mess deck, a student computer room, and an engine control room located approximately amidships. There was an emergency generator in a separate space on the 1<sup>st</sup> deck. A visit was made to an exemplar vessel that was visiting Honolulu during the investigation. It had a SOLAS<sup>1</sup> Cargo Vessel Safety Certificate. All available information from interviews, recovered equipment, brochures, etc. indicates that the Ehime Maru met the ship requirements for cargo vessels under “Chapter III Life-saving appliances and arrangements” of SOLAS.

b. The *USS Greeneville* was a Los Angeles Class (improved) attack submarine. There were four means of routine external access to/from the submarine. Forward of the sail was a weapons loading hatch. The bridge at the top of the sail was accessed from the control room through the sail access trunk<sup>2</sup>. Aft of the sail there were two escape hatches. The forward one was about twenty feet behind the sail. The aft escape hatch was behind the reactor compartment. The two escape hatches and the sail access were “double hatch” configurations, with a trunk between two separate watertight hatches.

### **Crew Information as pertains to Survival Factors**

The *Ehime Maru*’s personnel consisted of twenty officers and crew, two teachers, and thirteen maritime students. Most of the officers and many of the crew had been with the vessel since it’s commissioning in 1993. The students were on their 2<sup>nd</sup> cruise on the vessel as a part of their training program. The training emphasis was on engineering, with collateral instruction on fisheries.

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<sup>1</sup> SOLAS – International Convention for the Safety of Life at Sea, an international convention that covers a wide range of measures designed to improve the safety of shipping.

<sup>2</sup> The bridge is the location on top of the submarine’s sail from where the vessel is conned while on the surface. The control room is inside the pressure hull of the submarine for conning while the vessel is submerged. The bridge consists of two small openings in the top, forward portion of the sail. Normal manning is three people while on the surface.

At the time of the collision, there were three crew on watch in the *Ehime Maru*'s bridge. They were the Master and two seamen (a lookout and a helmsman). All three of these personnel survived. There were three crewmen on watch in the engine control room. They were the Chief Engineer, 1<sup>st</sup> Engineer, and 1<sup>st</sup> Oiler.

The USS *Greeneville*'s crew consisted of 106 officers and crew, and 17 riders<sup>3</sup>. Shortly after the collision, the Commanding Officer, an Officer of the Deck, a lookout, and two divers were on the bridge.

## **Description of Damage as pertains to Survival Factors**

### **(For details, refer to Damage Analysis Factual)**

The collision involved the hull and rudder post of the *USS Greeneville* striking the bottom of the hull of the *Ehime Maru*. Underwater examination of the *Ehime Maru* showed the following 3<sup>rd</sup> deck spaces cut open to the sea by the rudder post:

- Student lounge
- Access stairwell to student lounge
- Engine control room
- Engine room

The other results of the damage affecting survival factors were as follows (Based on survivor and first responder interviews, and aerial video)

- All electrical power was lost within 5 seconds after the collision and never regained.
- Fuel was seen venting from the tank vent tube on the port, forward corner of the fish deck.
- Fuel was seen in the fish hold.
- The survivors encountered a fuel/water mixture in the 2nd deck passageways.
- The *Ehime Maru* sank stern first about 6 minutes after the collision.
- All survivors, rafts, and debris that surfaced immediately after the *Ehime Maru* sank were initially in a small (several hundred yards in diameter) area.
- A heavy sheen of oil existed after the *Ehime Maru* sank.

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<sup>3</sup> The riders consisted of 16 civilian guests on board for familiarization and an officer escort.

## ***Ehime Maru* Emergency Systems/Survival Equipment**

### ***Communications***

The *Ehime Maru* was equipped with GMDSS<sup>4</sup> for Sea Area A3. As such, in the chart room behind the bridge there was a communications suite including radio and satellite communications ability. This suite was powered through normal ships power, the ship's emergency generator, or by an internal battery. Additionally, there was a 406 MHz Emergency Position Indicating Radio Beacon (EPIRB) installed in a hydrostatic release mount on the port side of the 02 deck, outside the bridge.

On the Bridge there was an additional VHF-FM two-way marine radio, a public address system, an internal telephone system, a fire alarm system, fiber-optic communications connection for the ship's computer network, and a general alarm system.

While paper work to document it was lost with the ship, it can be assumed that the Chief Radio Officer was the person carried to meet the requirements of SOLAS Regulation IV/16, which states in part:

"Every ship shall carry personnel qualified for distress and safety radio communication purposes to the satisfaction of the Administration. The personnel shall be holders of certificates specified in the radio regulations as appropriate, any one of whom shall be designated to have primary responsibility for radio communications during distress incidents."

According to the master and helmsman, the chief radio officer activated this EPIRB manually after the collision. The signal notification was relayed to the Joint Rescue Coordination Center (JRCC) in Honolulu at 1400W. The master also reported trying to call on a VHF-FM marine band radio, separate from the GMDSS system, but it had no power<sup>5</sup>. There is no indication that the GMDSS was activated other than the EPIRB.

### ***Life Rafts***

There were ten SOLAS<sup>6</sup>-approved life rafts on board the *Ehime Maru*. Eight were 25-person capacity and two were 6-person capacity. These were stowed on the

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<sup>4</sup> Global Marine Distress Signaling System (GMDSS) is a satellite-based system that allows rapid and convenient ship-to-ship and ship-to-shore communications for search and rescue purposes, and for access to maritime safety information, including navigational and meteorological warnings. Sea Area A3 is the area beyond 150 miles from shore and certification requires long-range radio and satellite communications.

<sup>5</sup> The GMDSS has backup power and VHF-FM capability, but was located in the chart room. The bridge mounted VHF-FM did not have backup power other than being on the emergency generator circuit, which did not energize after the collision.

<sup>6</sup> SOLAS - Safety of Life at Sea Convention that covers, among other things, specifications of lifesaving equipment.



01 deck, equally distributed on the port and starboard sides. All were mounted with hydrostatic releases<sup>7</sup>. There were also inflatable evacuation slides installed on each side of the 01 deck.

All life rafts released and inflated automatically when the vessel sank. They were initially in the immediate area of the survivors. At least one 6-person raft was inverted after inflation. The search and rescue (SAR) units eventually recovered all rafts.

### ***Lifejackets***

The *Ehime Maru* was equipped with SOLAS-approved automatic inflating lifejackets<sup>8</sup>. They were a dual chamber design, with a separate inflation mechanism for each chamber. Each person had a lifejacket stored in a locker at the foot of his bunk in his berthing compartment. Additionally, there were seven stored on the bridge and two in the engine control booth for watchstanders.

Twelve personnel reported wearing lifejackets as they abandoned the vessel. Two others had jackets with them but did not don them. The other twelve surviving personnel described not thinking to bring their lifejacket as they left their cabin or were not in the cabin at the time of collision and did not get one of the extras.

### ***Emergency Generator***

The *Ehime Maru* was outfitted with a diesel emergency generator located in a separate compartment on the starboard main deck level. It was equipped to automatically start in the event of loss of electrical power from the ship service generators. No survivor recalls hearing the generator running, and the master stated that the circuits powered by the emergency generator never received power after power was lost at the collision.

## **Medical and Pathological**

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<sup>7</sup> Hydrostatic releases are designed to automatically release life rafts from their mounts when the vessel sinks. They are triggered at 5 –25 foot depths. The raft containers float to the surface, and are automatically inflated by “tag lines” attached to the vessel by break-away links.

<sup>8</sup> The lifejacket is inflated by CO<sup>2</sup> cartridges that are triggered by either pulling a manual release or automatically upon immersion in water for approximately 4 seconds.

### Injury Summary Table

<sup>9</sup>	Crew	Teachers	Students	Total
Fatal	3	2	4	9
Serious	1	-	-	1
Minor	4	-	5	9
None	12	-	4	16
Total	20	2	13	35

### Survivor Injuries and Treatment

Honolulu Emergency Medical Services ambulances took ten personnel to two hospitals. The seriously injured crewman had a right clavicle fracture and was taken to Straub Hospital. He was admitted for observation and released on February 13<sup>th</sup>. The injury was sustained on the top of the pilothouse when a wave washed him into a searchlight assembly.

Four personnel complaining of nausea and diesel fuel ingestion were taken to Straub Hospital as well, treated, and released. Five personnel complaining of eye irritation from the diesel fuel were taken to Kaiser Hospital, treated, and released.

### Fatal Injuries

Nine personnel from the *Ehime Maru* died in the accident. Eight of the victims were recovered from inside the vessel during salvage operations in October 2001. One person remains unlocated. Survivors could accurately describe the locations of three of the deceased personnel before or after the collision:

- The Master and another crewman saw the Chief Radio Officer on the bridge wearing a life jacket after the collision.
- The 1<sup>st</sup> Oiler was with the Chief Engineer and 1<sup>st</sup> Engineer in the engine control room at the time of the collision.

None of the missing personnel were seen after the *Ehime Maru* sank, either by the survivors, *USS Greeneville* crewmen, or other rescue personnel. The specific locations of the victims when recovered are detailed in Attachment 5, which was

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<sup>9</sup> 49 CFR 830.2 defines a serious injury as one which requires hospitalization for more than 48 hours or fractures of a bone.

provided by LCDR G. Baumann of NAVSEA (NSSC) and compiled from divers' reports. One student remains missing.

A summary of the recovery locations is:

- Chief and First Engineer in the engineroom.
- Chief Radio Officer inside the bridge.
- Two students and a teacher in the student lounge and computer room.
- A student in the forward section of the 2<sup>nd</sup> deck.
- A teacher in the center passageway on the main deck. (The Navy Diagram lists this person as the missing student – it is assumed this is the position of the recovered teacher that is not otherwise identified on the diagram)

## Toxicological Analysis

**(To be incorporated in Human Performance Factual)**

***USS Greeneville:*** 25 personnel were drug screened with urinalysis by the Navy. Samples were taken from about 0645 through 0915 on February 10<sup>th</sup>. Tested personnel included the command personnel and personnel on watch in the control room. All tests were negative.

***Ehime Maru:*** The three personnel (master and two seamen) on the bridge at the time of the collision were tested for breath alcohol by the Coast Guard and for drugs by a private laboratory. This was done at the Coast Guard facility on the evening of February 9<sup>th</sup>. All tests were negative.

## Ehime Maru Evacuation

The survivors stated that the noon meal had been finished about 20 minutes before the collision. All survivors describe hearing and feeling two or three impacts as the first indication of the collision. No alarm or announcement was made, but all survivors describe knowing immediately there was a problem.

The majority of the survivors describe being on the 2<sup>nd</sup> deck at the time of the collision, either in their cabins or on the crews' mess deck. These general areas are outlined with rectangles on figure 1. Their primary egress routes were aft along the passageways to the ladder going up to the fantail area. The straight lines on figure 1 show this.

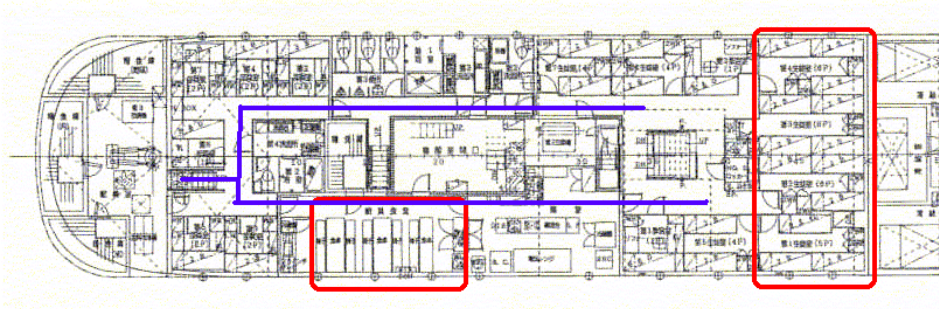


Figure 1. 2<sup>nd</sup> deck showing Berthing and Mess deck Areas

Those survivors who exited cabins on the 2<sup>nd</sup> deck near the stairwell descending to the 3<sup>rd</sup> deck describe the stairwell as being full of water and fuel as soon as they stepped out of their cabins.

The chief officer and 2<sup>nd</sup> engineer were in the washroom on the main deck at the time of the collision. After feeling and hearing the collision, the chief officer reports that he went out into the center passageway and then out to external walkway. He passed through the passageway where the deceased teacher was later found, but stated that he saw none of the missing personnel. The chief officer also reported that as he went around the front of the main deck superstructure the fish well area was already flooding as he passed.

As the *Ehime Maru* began to settle with the stern low in the water, the survivors described leaving the fantail and moving to the 01 deck, forward towards the pilot house. The abandon ship muster area for all hands was the open deck area on the 01 deck, behind the pilot house.

The master and two seamen were on watch on the bridge at the time of the collision. The master tried sounding the general alarm and making a public address system announcement after the collision but the ship had lost main electrical power, the emergency generator did not come on line, and those systems had no battery backups. He directed the Chief Radio Officer, who arrived on the bridge immediately after the impact, to activate the EPIRB located outside on the bridge wing

The First Oiler was in the engine control room on the 3<sup>rd</sup> deck at the time of the collision, seated next to the chief and 1<sup>st</sup> engineers. He felt and heard a loud scrape and then an impact. Immediately everything went black and filled with water and fuel. The flooding of the space knocked him violently around. He did not see the other engineers after the impact. He was carried by water through the engine room and up a ladder to the 2<sup>nd</sup> deck. From there he climbed up and out of the vessel through the passageways. He was on top of the pilothouse when a wave washed him against a search light mount, injuring his shoulder.

All survivors reported gathering in the abandon ship muster area, on the 01 deck behind the pilothouse. As the ship sank, some personnel described being washed or stepping into the sea from there. Others stated that they climbed to the top of the pilothouse and were washed off. Several personnel described being initially pulled down by the suction from the ship. They either swam to the surface or were carried there by the automatic inflation of their life jackets. During interviews, several personnel described the *Ehime Maru* sinking with gestures indicating a 30 –45 degree stern down angle.

As the *Ehime Maru* sank the life rafts' hydrostatic releases activated and the rafts came to the surface and automatically inflated. They surfaced near the personnel in the water. The furthest any survivor described swimming was 5 meters to a raft. All survivors were able to enter a raft within 3-5 minutes after the vessel sank. The first persons in the rafts describe assisting others in and looking for anyone still in the water.

During NTSB interviews no survivor recalled seeing any of the deceased personnel except the Chief radio Officer, Chief Engineer, and 1<sup>st</sup> Engineer as described above. The Master and Chief Officer described the *Ehime Maru*'s coming to nearly a 45 degree bow-up angle and sliding back under the water

## **Emergency Response**

### **Search and Rescue (SAR)**

#### ***United States National Search and Rescue Plan – 1999***

This plan is provided to coordinate civil search and rescue (SAR) services to meet domestic needs and international commitments. Implementing guidance is provided by the National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual (IAMSAR Manual). Federal agency signatories to this plan are the Department of Defense, Department of Transportation, Department of Commerce, Department of Interior, the Federal Communications Commission, and the National Aeronautics and Space Administration.

The National SAR Plan establishes Search and Rescue Regions (SRR) to ensure complete coverage of all United States' areas of responsibility. Each SRR has a Rescue Coordination Center (RCC) to coordinate all SAR activities in the region. The National SAR Plan also designates SAR Coordinators who have overall responsibility for providing or arranging for SAR services with the SRR.

The Hawaiian Islands are in the center of the Honolulu SRR, which covers about half of the Pacific Ocean. The U.S. Coast Guard is the designated U.S. aeronautical and maritime SAR coordinator for the Honolulu SRR. The RCC for the

Honolulu SRR is operated by the Fourteenth Coast Guard District in Honolulu, HI. Therefore, under the National SAR Plan the District RCC had responsibility for oversight of the SAR response in this accident.

### ***Notification***

The first external notification of the collision was from the *USS Greeneville* to the Operations Center of the Navy's Commander, Submarine Forces, Pacific (COMSUBPAC). This was by secure satellite telephone at 1348W, 5 minutes after the collision.

The transcript of communications between the USS Greeneville and COMSUBPAC shows the following transmissions (time in HHMMSS format:

134817	Greeneville, this is COMSUBPAC, standing by for Oprep-3 Navy Blue
134828	COMSUBPAC, this is USS Greeneville, Break, My position, 21-05.5N, 157-49.1W, situation, have experienced collision with surface vessel upon surfacing ship. Break. Vessel appears to be taking on water and sinking at this time. I say again, the surface vessel appears to be taking on water and sinking at this time. How copy over?
134909	Greeneville, this is COMSUBPAC, Roger, copy your whiskey 21-05.5N, 157-49.1W. Break. Have suffered collision with surface vessel and the vessel is taking on water. Over.
134929	COMSUBPAC this is USS Greeneville, Have Coast Guard contacted immediately (unintelligible) put people into this area to render assistance to small boat that has people in the water. Over.
134950	Greeneville, this is COMSUBPAC. Roger, understand. Contacting Coast Guard to allow for people to be rescued from vessel that is taking on water.

COMSUBPAC Operations Center notified its command personnel. They also contacted Coast Guard Group Honolulu by both landline telephone and VHF-FM marine radio at 1355W. After the initial call, the COMSUBPAC Operations Center Chief insisted that Group Honolulu keep an open telephone line contact for several hours. This tied up one of two incoming lines in the Group Operations Center. The Coast Guard watch standers stated that this slowed coordination with other units.

Independently, at 1400W the Joint Rescue Coordination Center (JRCC)<sup>10</sup> in Honolulu received the alert generated by the EPIRB described in the section on

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<sup>10</sup> The JRCC is jointly manned by Coast Guard and Air Force personnel, and coordinates all search and rescue activities in the Central Pacific.

*Ehime Maru* emergency equipment.

### ***USS Greeneville Response***<sup>11</sup>

After the collision, the *USS Greeneville* remained on the surface. According to the OOD, he and the lookout manned the bridge within 6 minutes of surfacing. The *Ehime Maru* had already sunk and the OOD conned the *USS Greeneville* in a right turn, returning to the area of the rafts and debris. This was confirmed through the post collision plot developed in the NTSB Research and Engineering factual report. The lookout stated he began searching the area for survivors in the water while the OOD conned the submarine towards the rafts. The OOD maneuvered close to the rafts trying to observe the number and status of the personnel in them.

The OOD called to the personnel in two rafts that the *USS Greeneville* approached closely. According to both the OOD and the survivors, they were unable to communicate because of the English/Japanese language barrier. The Master spoke broken English, but he was not in either of the rafts the *USS Greeneville* approached.

The OOD reported that the *USS Greeneville* set the man overboard response. As a part of this, two swimmers and a tending team mustered in the passageway near the forward escape trunk with their equipment. The normal procedure was for the divers to access the submarine's main deck and deploy from the deck into the water, tended with lines by personnel on the main deck. The OOD described that the *USS Greeneville* was unable to open its main deck hatches because of waves breaking across the deck (see weather outlined in Operations factual). The only usable outside access was through the sail access trunk.

The OOD described that he and the CO discussed this and decided to bring the two divers to the bridge area. The two swimmers were on the bridge within 10 minutes of the collision. The divers stated that a Jacobs's<sup>12</sup> ladder had been rigged on the port side of the sail. They also discussed with the OOD possible methods of hoisting an injured person up the side of the sail<sup>13</sup>. Videotape taken from the Coast Guard helicopter as it arrived on scene confirmed that waves were washing across the *USS Greeneville's* main deck and a Jacobs's ladder had been rigged on the side of the submarine's sail.

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<sup>11</sup> A more detailed chronology is included as Attachment 9.

<sup>12</sup> A rope ladder with wooden or plastic steps.

<sup>13</sup> The method described had been described to but never seen by any of the personnel on board. It would involve attaching a line between a periscope and a person on deck and then raising the periscope to lift the person. The divers described that getting an injured person down the access trunk from the bridge to the control room would be very difficult because of the confine spaces involved.

The OOD said that his intent was to put a diver in the water from the bridge if anyone was located in the water. This was based on a risk assessment he and the CO discussed. The divers described that their protocol would have been to put one diver down the Jacobs ladder and down the side of the hull into the water. The second diver would be tending the first diver's line from the bridge.

*USS Greeneville* personnel continued to search the immediate vicinity for personnel in the water, both from the bridge and from the control room using both periscopes. No one was seen in the water. The OOD reported seeing one person lying still in the bottom of a raft. Although this person appeared to be injured, the OOD stated he elected to not put a diver in the water at that point because the Coast Guard resources were due on scene soon. The OOD also stated that the CO had the control room use one of the periscopes and keep track of the life raft positions.

The OOD reported that the CO also brought a handheld VHF-FM marine radio with him to the bridge. The OOD recalls the CO using it to contact the arriving Coast Guard resources as they arrived on scene. No information was obtained from the CO regarding his use of this radio.

### ***Coast Guard Response***

A Coast Guard HH65A helicopter<sup>14</sup> airborne on patrol was diverted by Group Honolulu within a minute of notification. It arrived on scene at 1427W, 45 minutes after the collision. It conducted a sector<sup>15</sup> search for people in the water with a 1 mile radius centered on the rafts and debris.

Two Coast Guard boats were dispatched from Station Honolulu at 1357W. They were a 21-foot Rigid Hull Inflatable (RHI) with 3 crew and a 41-foot patrol boat (UTB) with 7 crew, one of which was trained as an emergency medical technician.

The faster RHI arrived on scene at 1431W. It went sequentially to each raft, counting personnel, searching for injuries, and to locate someone who spoke English. The master of the *Ehime Maru* was located in this manner.

The UTB arrived on scene at 1444W. The HH65A lowered its rescue swimmer by hoist to the UTB to provide additional medical and rescue assistance. The UTB approached the largest group of rafts (3 tied together). The rescue swimmer stated that he immediately entered these rafts. Moving from raft to raft, he medically assessed all the survivors in them. One had injuries to his shoulder (see medical section). Retrieving a medical kit from the UTB, the rescue swimmer

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<sup>14</sup> The normal minimum crew on a HH65A is two pilots and a hoist operator. On this flight, there was also a rescue swimmer on board as an extra crewman.

<sup>15</sup> A circular search pattern that concentrates on the center of the search area



immobilized the arm and injured shoulder on that crewman. Other survivors were complaining of eye irritation from fuel. Bottles of water from the raft survival kits were used to flush their eyes.

According to the coxswain on the RHI, the master was located in another raft by the RHI and taken on board. The master and RHI crew continued to count survivors in the rafts and determined that 9 personnel were missing<sup>16</sup>. This information was radioed back to Group Honolulu.

The RHI began ferrying the survivors not in the three rafts next to the UTB to the UTB. At this point both the coxswain and the USS *Greeneville*'s OOD state that the PHI called the *USS Greeneville* on VHF-FM radio and had the submarine back away because the reflected waves from the submarine's hull were interfering with the small boat operations.

The rescue swimmer and the EMT-trained boat crewman medically assessed the twenty-six survivors. The injured crewman was placed on a backboard and moved from the raft to the UTB. The survivors were distributed between the two Coast Guard boats and the boats departed scene at 1538W

The Coast Guard boats arrived at Station Honolulu with the survivors at 1615W. At that point, Honolulu Emergency Medical Services took charge of their medical examination and transportation as described in section 5.2.

After transferring its rescue swimmer, the HH65 continued to search for survivors in the water. The *USS Greeneville* also continued to search the area of raft and debris. The HH65 departed scene because of low fuel at 1510W. It refueled and was back on scene searching at 1556W. A Coast Guard C-130 aircraft was diverted from a training mission and arrived on scene at 1524W.

The *CGC Kittiwake* was the standby Coast Guard SAR vessel<sup>17</sup>, but it was several hours away at another island. The *CGC Assateague* was in Honolulu but in a maintenance status. Its personnel were recalled, maintenance terminated, and it got underway at 1619W. It arrived on scene at 1656W.

When COMSUBPAC command personnel received the report of people in the rafts, they sortied two Torpedo Retriever boats (WTR's), *Hawthorne 5* (83') and *Hawthorne 8* (97'), at 1447W. The first of these arrived on scene at 1600W. They searched the area for additional survivors without result. The on-scene commander (*CGC Assateague*) also had them recover the life rafts to avoid confusion in the

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<sup>16</sup> The original report was that 10 personnel were missing because the master forgot to count himself.

<sup>17</sup> The SAR standby vessel is one major cutter (110 feet or larger) that provides larger unit response capability for the Hawaiian Islands. Depending on home port and tasking, it may be anywhere in the Islands.

continuing search. All ten of the Ehime Maru's life rafts were recovered by the WTR's.

Two navy aircraft, a P-3 and an HH-60, were also launched to search. They arrived on scene at 1650W.

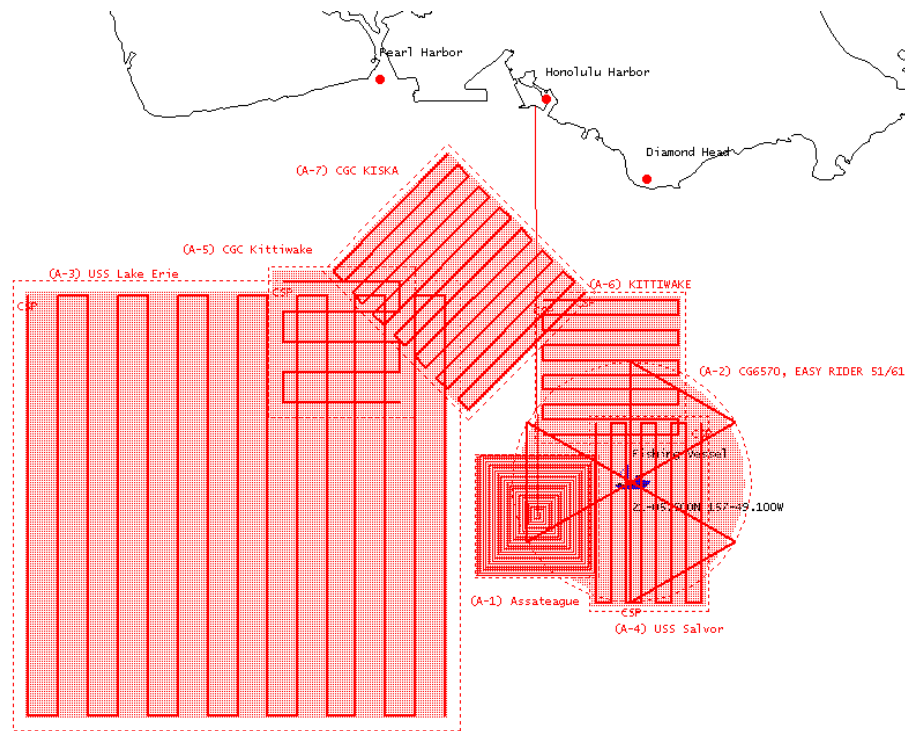
### ***Response Command/Control***

When COMSUBPAC received initial notification at 1348W, its command personnel initially assumed Search and Rescue mission coordinator (SMC) for the Navy response. They identified immediately available Navy resources (the WTR's, Hawthorne 5 and Hawthorne 8) and directed they get underway. After notifying the Coast Guard and recognizing their response, COMSUBPAC asked Group Honolulu to assume overall SMC at 1504W.

Coast Guard Group Honolulu assumed SMC for the case upon their initial notification from the Navy at 1355W, as per their Standard Operating Procedures. At 1505W, the JRCC assumed SMC because of the building magnitude of the case. The JRCC controlled the assignment of search patterns to all responding resources, including Navy. On the first afternoon, they did not control or coordinate the influx of Navy resources into the search but did assign search areas as units got underway or airborne.

On-scene commander duties (OSC) were initially assumed by the HH65A when it arrived on scene. A Coast Guard C130 aircraft was diverted from a training flight as the survivors were being picked up. It arrived on scene at 1524W and assumed OSC for both surface and air assets. It was relieved of OSC duties when the *CGC Assateague* (110' patrol boat) arrived.

The USS Lake Erie, a cruiser, assumed OSC duties for both surface and air assets at 2057W. It maintained control of the following assest through the night of February 9<sup>th</sup>: USS Greeneville, USS Salvor, USCGC Kiska, USCGC Kittiwake, 2 USN P-3 airplanes, 2 USN SH-60 helicopters, one USCG HH-65A helicopter. The search areas covered designated "ALPHA", are outlined in attachment three and illustrated in figure 1 below.



### ***Extended Search***

The search for any additional survivors continued the rest of February 9<sup>th</sup>, and nearly continuously for the next 21 days. Attachment 2. is a message from the JRCC describing the first three days of searching. Attachment 3 is a more detailed description of the areas and units involved in February 9<sup>th</sup> through February 14<sup>th</sup>. Coast Guard and/or Navy units were on scene continuously. Two civilian vessels of Japanese registry participated as well.

The *USS Greenville* remained in the area until sunrise on February 10<sup>th</sup>. It was not assigned a search area by the SMC. According to the OOD, its bridge personnel continued to search for persons in the water, using a night vision monocular after dark.

On February 16<sup>th</sup>, the sunken *Ehime Maru* was located on the sea floor in 2000 feet of water. For the next week, two underwater remotely operated vehicles (ROV's), the *Scorpio* and the *Deep Drone*, searched its exterior and the sea bottom surrounding it.

The active search was suspended on March 2<sup>nd</sup>. None of the missing personnel were

located during this search.

## **Medical Response**

The *USS Greeneville* had an independent duty Hospital Corpsman (HM) as its primary medical resource. The *USS Greeneville* divers had basic first aid training. The HM set up a treatment area in the wardroom after the collision in anticipation of treatment. No survivors were brought on board the *USS Greeneville*.

The Coast Guard HH65 that was diverted at the first report had a Rescue Swimmer on board. This swimmer was a trained paramedic and had a basic medical kit with him. The helicopter aircraft commander decided to hoist the swimmer down to the Coast Guard UTB to get the greatest medical help to the survivors as soon as possible.

One of the crewmen on the Coast Guard UTB was a trained Emergency Medical Technician. The UTB had a medical kit, a Miller Board<sup>18</sup>, and a litter.

After the UTB was alongside the three grouped rafts, the rescue swimmer entered the rafts. He assessed all the personnel in the rafts and identified the one most seriously injured (Broken clavicle). The Miller board was passed into the raft and the injured crewman strapped to it. He was then lifted onto the UTB and placed on the open deck behind the UTB's cabin.

Other personnel had diesel fuel irritating their eyes. Water bottles from the survival equipment on the rafts were opened and used to flush eyes.

During the return trip to shore, the Rescue Swimmer and EMT-trained crewman monitored the injured crewman. They also continued to assess the other survivors, looking for signs of shock.

Upon the Coast Guard boats' return to Station Honolulu, the Honolulu Emergency Medical Services reassessed all the survivors and transported ten personnel as described in section 5.2.

## **Response Coordination/Contingency Plans**

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<sup>18</sup> A Miler board is a type of litter designed to allow a patient to be strapped in and immobilized in the event of back or neck trauma.

### ***Ehime Maru***

The crew conducted an abandon ship drill shortly after leaving port in Japan on January 8<sup>th</sup>. There were no crew changes in Honolulu, the only port call. This drill included mustering and life jacket donning instruction. The abandon ship muster station for all personnel was the open area immediately aft of the pilot house on the 01 deck.<sup>19</sup>

### ***USS Greeneville***

Man overboard drills had been conducted during a cruise the previous summer. Standard recovery method is to use rescue swimmers deployed from the main deck of the submarine, connected with a line tended by personnel on the deck. Standard operating procedure and training is that a tending line to the submarine is always used.

With regard to medical emergencies, the standard operating procedure is to bring injured personnel to the HM who establishes a medical treatment station in the submarine's officer's wardroom.

### ***COMSUBPAC***

COMSUBPAC Operations Center is established and continually manned to monitor U. S. Navy submarine operations in the Pacific. Their standard operating procedure requires that a submarine notify their operations center within five minutes of an emergency event. When the COMSUBPAC operations center got this notification, there was notification of the COMSUBPAC chain-of-command.

There was no interagency plan between the Navy and the Coast Guard in Hawaii for SAR response. The Operations Center had no preset procedure for contacting the Coast Guard. This resulted in different Operations Center personnel contacting Coast Guard Group Honolulu simultaneously by both telephone and channel 16 VHF-FM marine band radio. The Operations Center insisted on keeping the telephone line to Group Honolulu open for several hours during the initial response. During interviews with the Captain in charge of the Operations Center, he acknowledged that they had no clear picture of the Coast Guard Group or RCC capabilities and organization.

COMSUBPAC initiated the dispatching of US Navy vessels and aircraft for response, independent of the Coast Guard notification. At 1505W the Operations Center asked Coast Guard Group Honolulu to assume SAR Mission Coordinator (SMC). For the rest of February 9<sup>th</sup>, the Operations Center continued to independently identify and launch Navy air and sea resources, notifying the Coast

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<sup>19</sup> This drill met the requirement of SOLAS Chapter III, Part B, Regulation 18 Abandon ship training and drills, which requires an abandon ship drill every month.

Guard when they were enroute.

### ***Coast Guard Group Honolulu***

Coast Guard Group Honolulu maintains a combination Operations and Communication center that controls and monitors all Coast Guard operations in the Hawaiian Islands. The Group duty officer assumed SMC for the Coast Guard response upon notification of the collision as per their standard operating procedure. Because the HH65A was maintaining a radio guard with the Group Communications Center, the group was aware that it was airborne in the general vicinity. Likewise, the Group duty officer knew that the *CGC Kittiwake* was the SAR standby vessel but was several hours away. The Group duty officer was able to initiate a recall of the *CGC Assateague*, which was in a maintenance status. It got underway within an hour of notification, with personnel from several adjacent cutters to make up for missing personnel.

### ***Joint Rescue Coordination Center***

The Fourteenth Coast Guard District in Honolulu, HI operates the Joint Rescue Coordination Center. It is jointly manned by Coast Guard and Air Force personnel and is responsible for United States maritime and land search and rescue operations throughout the Pacific.

### ***Honolulu Emergency Medical Services Division***

They maintain a dispatch center in Honolulu. Their dispatcher coordinated the space availability of the local hospitals through their communications network and provided ambulances from the Coast Guard Station to the two hospitals.

## **Previous Accident**

On June 14, 1989, the U.S. Tug *Barcona* was underway in San Pedro Channel, California with two empty barges in tow astern. The *USS Houston*, a Navy submarine similar to *USS Greeneville*, came to periscope depth nearby and an antenna snagged the *Barcona's* towline. During the *USS Houston's* emergency dive following this, the *Barcona* was swamped. Two of the three crewmen escaped and were rescued. The third was never located and was presumed dead. As soon as the submarine was on the surface (2 hours later) it contacted the Coast Guard to report the accident. The *USS Houston* reported the accident to shore based Naval authorities an hour earlier by radio teletype message (Chief of Naval Operations, Commander in Chief Pacific Fleet, and COMSUBPAC among others), but they did not relay the information to local SAR authorities.

Recommendation M-90-69 was issued to the U.S. Navy on October 22, 1990:

Review and amend, as appropriate, U.S. Navy procedures to require shoreside Naval commands to notify local Coast Guard search and rescue authorities whenever a Naval vessel reports involvement in an accident with another vessel in U. S. coastal waters.

The U. S. Navy's response on November 19, 1990 stated in part:

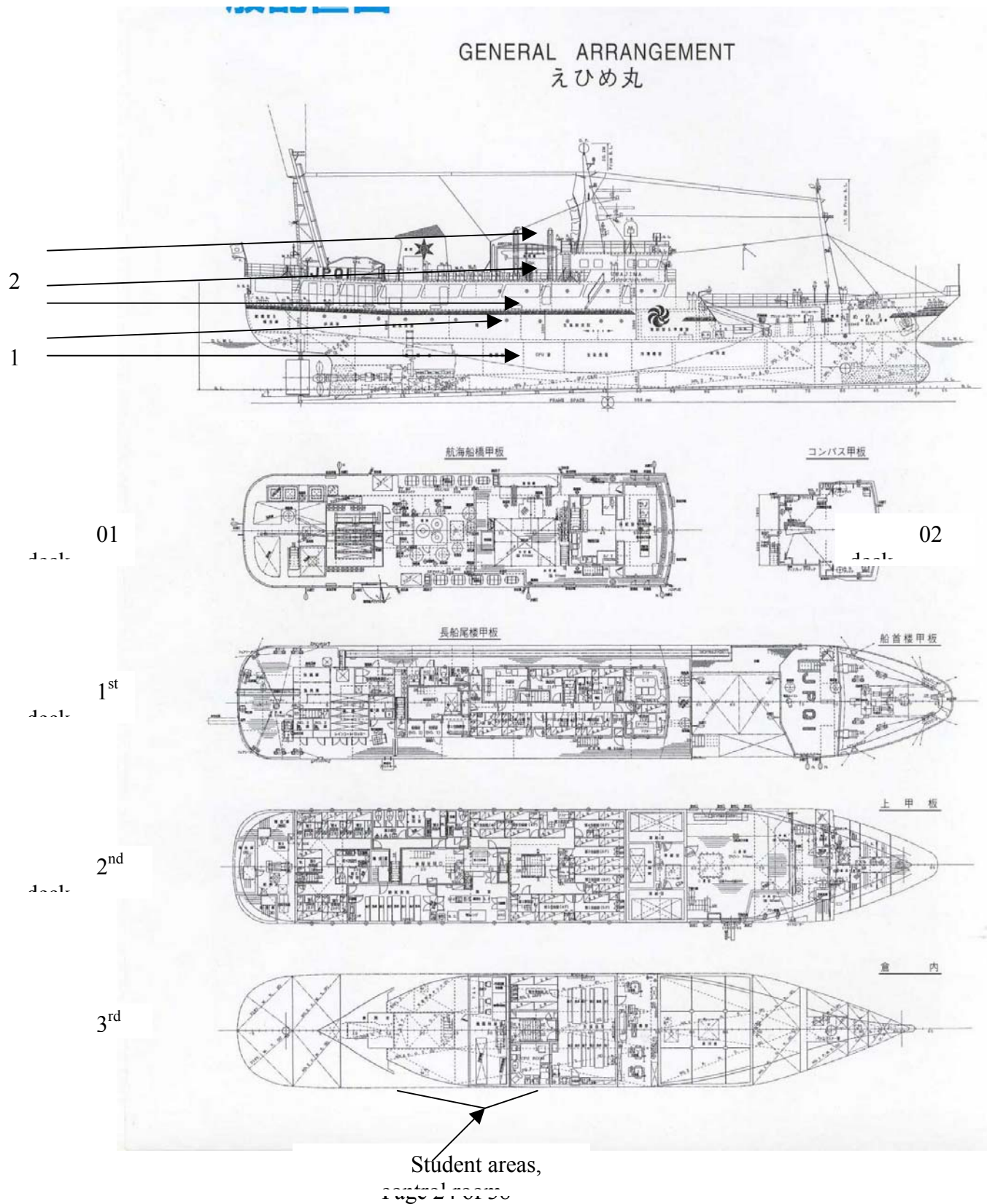
"The evidence collected by NTSB does not indicate that an additional procedure requiring shoreside Naval Commands to notify local Coast Guard search and rescue authorities whenever a Naval vessel reports involvement in an accident with another vessel is required or would have changed the outcome in this accident."

On April 29, 1991 the recommendation was classified  
"Closed—Unacceptable Action"

## **Attachments**

- (1) Ehime Maru Diagram
- (2) JRCC SAR Summary message for period from 9 – 11 February.
- (3) Search Area Details 9 – 13 February.
- (4) Chronology of events on February 9<sup>th</sup>.
- (5) Diagram of victim recovery locations on *Ehime Maru*.
- (6) Summary of Interviews with Ehime Maru Students
- (7) Summary of Interviews with Ehime Maru Crew
- (8) List of Ehime Maru Personnel
- (9) Chronology of Actions Onboard USS Greeneville Following the Collision

# Attachment 1. Drawings of the *Ehime Maru* Layout.





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## Attachment 2. JRCC SAR Summary message for period from 9 – 11 February.

P 120936Z FEB 01

FM CENPACSARCOORD HONOLULU HI

TO PACSARCOORD ALAMEDA CA

COMDT COGARD WASHINGTON DC/ /G-OPF/ /

BT

UNCLAS //NI6133//

SUBJ: COLLISION OF *USS GREENEVILLE* AND TRAINING VESSEL *EHIME MARU* (JA)

10NM SOUTH OF DIAMOND HEAD, OAHU, HI. 21-05.5N 157-49.1W.

PERIOD: 09235SZ FEB 01 TO 120900Z FEB 01

### 1. SITUATION:

- A. CURRENT STATUS:** SEARCH CONTINUES FOR 9 CREWMEMBERS UNLOCATED FROM THE *EHIME MARU* (JA), 26 CREWMEMBERS HAVE BEEN RECOVERED. CGD14 JRCC IS SMC.
- B. NOTIFICATION:** 09135SW FEB 01 CG GROUP HONOLULU RCVD INITIAL REPORT FROM COMSUBPAC, PEARL HARBOR.
- C. NARRATIVE:** *USS GREENEVILLE* AND TRAINING VESSEL *EHIME MARU* (JA) COLLIDED 10NM SOUTH OF DIAMOND HEAD. A TOTAL OF 26 CREWMEMBERS FROM VSL *EHIME MARU* WERE RECOVERED AFTER THE VESSEL SANK. SEARCH EFFORTS CONTINUE FOR NINE MISSING CREWMEMBERS USING USN, USCG AND JAPANESE ASSETS.
- D. DESC:** *USS GREENEVILLE* (SSN 772) LOS ANGELES CLASS SUBMARINE; *EHIME MARU* (JA), FISHERIES TRAINING VESSEL, CALL SIGN JPQI, JA REG# 135174, 190FT STEEL HULL, 2 MF/HF RADIOTELEPHONE, 1 VHF RADIO, INMARSAT B FAX/TELEPHONE, GMDSS RADIO EQUIPMENT, 741 GROSS TONS.
- E. POB INFO:** 35 TOTAL CREWMEMBERS; 26 RECOVERED; THE 9 MISSING CREWMEMBERS INCLUDE 4 CADETS, 2 TEACHERS, AND 3 CREW.
- F. WX:** SEAS 4-6FT, WINDS 120T AT 10KTS, VIS 08NM, AIR TEMP 70F, WATER TEMP 78F.

### 2. ACTION TAKEN:

- A. 09 FEB 01:** USCG GROUP HONOLULU INITIALLY NOTIFIED OF INCIDENT BY USN COMSUBPAC AT 1355W AND ASSUMED SMC. GROUP IMMEDIATELY DIVERTED CG6570 FROM LE PATROL. GROUP ALSO DIRECTED STA HONOLULU TO LAUNCH UTB AND RHIB AND RECALLED CGC ASSATEAGUE FROM 'C' STATUS. CG6570 ARRIVED O/S AT 1427W, LOCATED *USS GREENEVILLE*, SEVERAL LIFERAFTS W/POB AND DEBRIS. NO PIW'S WERE SIGHTED. CG6570 VECTORED IN BOTH STA HONO SMALL BOATS WHO RETRIEVED 26 SURVIVORS AND BEGAN TRIAGE. CG6 570 DEPLOYED R/ S TO ASSIST VICTIMS AND BEGAN REPEATED VECTOR SEARCHES OVER THE INCIDENT AREA, NO ADDITIONAL SURVIVORS SIGHTED. AT APPROX 1445W COMSUBPAC DIRECTED TWO TORPEDO RECOVERY VESSELS (TRV) TO SCENE. RCC HONOLULU ASSUMED SMC AT 1506W. CG1714 DIVERTED FROM TRAINING MISSION, ARRIVED O/S AT 1524W AND ASSUMED OSC. BOTH CG6570 AND CG1714 DEPLOYED DMB'S SHORTLY AFTER ARRIVING O/S. AT 1615W SURVIVORS ARRIVED AT STA HONO, WERE PROVIDED MEDICAL CARE, AND WERE DEBRIEFED BY MSO HONO PERSONNEL. THE MASTER OF *EHIME MARU* STATED HIS VSL LOST ALL POWER IMMEDIATELY FOLLOWING COLLISION AND WAS UNABLE TO ANNOUNCE ABANDON SHIP. HE ALSO STATED THAT ALL POB SEEN ENTERING THE WATER WERE ABLE TO BOARD LIFERAFTS. ALL NINE MISSING CREWMEMBERS WERE BELIEVED TO BE BELOW DECKS. AT 1656W CGC ASSATEAGUE ARRIVED O/S, ASSUMED SURFACE OSC AND RPTD CONCENTRATED DEBRIS FIELD/OIL SHEEN. SPILL TRAJECTORY, PROVIDED BY NOAA SSC, INDICATED NO IMPACT TO OAHU SHORELINE. MSO/GROUP EST 05 NM SAFETY ZONE. AT 2057W *USS LAKE ERIE* ASSUMED AIR AND SURFACE OSC OF THE FOLLOWING ADDITIONAL ASSETS THROUGH THE NIGHT: *USS GREENEVILLE*, *USS SALVOR*, CGC KISKA, CGC KITTIWAKE, TWO USN P-3 A/C, TWO USN SH-60 HELOS, ONE USCG HH-65. EIGHT ALFA SEARCHES WERE CONDUCTED COVERING AN

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ESTIMATED 450 SQNM.

**B. 10 FEB 01:** SEARCH CONTINUED THROUGHOUT THE DAY. USS LAKE ERIE REMAINED OSC AND EXECUTED THE DAY'S SEARCH EFFORTS AS DIRECTED BY RCC HONOLULU. S/V NIPPON MARU (JA) JOINED THE SEARCH EFFORT. SIX VSLs AND FIVE A/C SEARCHED APPROX 1950 SQNM DURING 13 BRAVO SEARCHES. AT 0700W COTP HONO ASSUMED FOSC FOR POLLUTION RESPONSE. AT APPROX 1230W DI4 (DCS), ACTING DISTRICT COMMANDER, BRIEFED MR. TAKAHASHI FROM JAPAN CONSULATE ON THE SEARCH EFFORTS. AT 1500W DI4 (DCS/OSR) BRIEFED JAPANESE VICE MINISTER OF FOREIGN AFFAIRS, MR. SAKURADA, AND CONSUL GENERAL, MR. SHIBUYA, ON COMBINED SAR EFFORTS. AT 1630W DI4 (OSR) BRIEFED NTSB MBRS. AT 1900W INVESTIGATIVE ORGANIZATION~ MTG HELD, NTSB ASSUMED LEAD AGENCY FOR MARITIME ACCIDENT INVESTIGATION.

**C. 11 FEB 01:** SEARCH CONTINUES. USS LAKE ERIE REMAINS OSC OF THE FOLLOWING SEARCH ASSETS: USS SALVOR, USS HAWTHORNE 5, USS HAWTHORNE 8, CGC KITTIWAKE, S/V NIPPON MARU, ONE USCG C-130, ONE USCG HH-65, ONE USN P-3, AND ONE USN SH-60. PLANNED THROUGH 120000W, FIFTEEN CHARLIE SEARCHES COVERING APPROX 2975 SQNM. AT 1330W DI4 (O) BRIEFED FAMILY MBRS OF NINE UNACCOUNTED FOR CREWMBRS ON SEARCH EFFORTS. SHORTLY AFTERWARDS, CONDUCTED PRESS BRIEFING FOR LOCAL, NATIONAL AND INTERNATIONAL MEDIA.

**D. 12-13 FEB 01:** PLAN AND EXECUTE DELTA AND ECHO SEARCHES UTILIZING SAME AIR AND SURFACE ASSETS.

**3. FACTORS LEADING TO RECOMMENDATION TO SUSPEND ACTIVE SEARCH:**

- A. EXACT CERTAINTY OF POSITION AND TIME OF COLLISION.
- B. EXTENSIVE CONCENTRATED SEARCH EFFORTS WITHIN 30 MINUTES OF COLLISION BY CG HELO AND RHI.
- C. *USS GREENEVILLE* ON SCENE, ON SURFACE SEARCHING WITHIN MINUTES OF COLLISION.
- D. MASTER OF F/V *EHIME MARU* REPORTED THE FOLLOWING:
  - 1. POWER WAS LOST IMMEDIATELY, UNABLE TO SOUND ABANDON SHIP ALARM
  - 2 .VSL SANK WITHIN MINUTES, ALL LIFERAFTS SELF DEPLOYED
  - 3 .ALL CREWMBRS SEEN ENTERING THE WATER BOARDED A LIFERAFT
  - 4 .ALL NINE UNACCOUNTED FOR CREWMBRS WERE REPORTED TO BE BELOW DECKS AT THE TIME OF THE COLLISION
- E. SEARCH CONDITIONS WERE FAVORABLE THROUGHOUT
- F. DUE TO THE DEPTH OF WATER IN THE VICINITY OF THE COLLISION, NO REASONABLE CHANCE OF SURVIVAL FOR PERSONS TRAPPED BELOW DECK.
- G. NO SURVIVORS IN LIFERAFTS HAD TIME TO DON PFD'S.
- H. EXHAUSTION AND HYPOTHERMIA CONSIDERATIONS AFTER 100 HOURS.

### Attachment 3 Search Area Details

#### CASE 271-01 SUBMARINE COLLISION

AREA	UNIT	SQ NM	PERCENT COMPLETE	TIMES COVERED	TOTALS-->	21,029	20,951
						TOTAL SQ NM SEARCHED	TOT SQ NM SCHEDULED
A-1	CGC ASSATEAGUE	16	100%	1		16	16
A-2	H-65, H-60	50	100%	4		200	200
A-3	USS LAKE ERIE	225	100%	1		225	225
A-4	USS SALVOR	26	100%	1		26	26
A-5	CGC KITTIWAKE	25	100%	1		25	25
A-6	CGC KITTIWAKE	25	100%	1		25	25
A-7	CGC KISKA	25	100%	1		25	25
B-1	C-130	600	100%	2		1200	1200
B-2	P-3	400	100%	2		800	800
B-3	H-65	79	100%	2		158	158
B-4	NONE						0
B-5	NIPPON MARU	40	100%	1		40	40
B-6	HAWTHORNE 8	40	100%	1		40	40
B-7	CGC KITTIWAKE	18	100%	1		18	18
B-8	USS LAKE ERIE	80	100%	1		80	80
B-9	USS SALVOR	50	100%	1		50	50
B-10	CGC KISKA	25	100%	1		25	25
B-11	H-65	100	100%	2		200	200
B-12	P-3	400	100%	2		800	800
B-14	H-60	100	100%	3		300	300
C-1	USS SALVOR	90	24%	1		21.6	90
C-2	CGC KISKA	200	100%	2		400	400
C-3	C-130	600	100%	1		600	600
C-4	H-65	100	100%	1		100	100
C-5	P-3	900	100%	1		900	900
C-6	USS LAKE ERIE	80	100%	1		80	80
C-7	CGC KISKA	100	100%	1		100	100
C-8	HAWTHORNE 8	30	100%	1		30	30
C-9	NIPPON MARU	25	100%	1		25	25
C-10	HAWTHORNE 5	100	100%	1		100	100
C-11	KISKA	100	100%	1		100	100
C-12	H-65	100	100%	1		100	100
C-13	SH-60	85	100%	1		85	85
C-14	NONE						0
C-15	P-3	900	100%	1		900	900
D-1	C-130	1642.25	100%	1		1642.25	1642.25
D-2	USS SALVOR	100	100%	1		100	100
D-3	KISKA	100	64%	1		64	100
D-4	H-65	212.1	100%	1		212.1	212.1
D-5	P-3	1567.21	115%	1		1802.2915	1567.21
D-6	USS PORT ROYAL	100	90%	1		90	100
D-7	HAWTHORNE 8	47.63	100%	1		47.63	47.63
D-8	H-60	78.48	100%	2		156.96	156.96
D-9	P-3	791.6	100%	1		791.6	791.6
D-10	HAWTHORNE 8	42.2	0%	1			42.2

Search Areas A – February 9<sup>th</sup>Search Areas B – February 10<sup>th</sup>

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Search Areas C – February 11<sup>th</sup>

Search Areas D – February 12<sup>th</sup>

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# CASE 271-01 SUBMARINE COLLISION

E-1	P-3	1261.15	100%	2	2522.3	2522.3
E-2	H-65	77	100%	1	77	77
E-3	CG-130	1305	100%	1	1305	1305
E-4	CGC KISKA	78.95	100%	1	78.95	78.95
E-5	USS SALVOR	79.9	100%	1	79.9	79.9
E-6	USS PORT ROYAL	104.25	100%	2	208.5	208.5
E-7	H-65	77	100%	1	77	77
E-8	H-60	108	100%	1	108	108
E-9	P-3	1360	100%	1	1360	1360
E-10	H-60	108	100%	1	108	108
F-1	P-3	1050	100%	1	1050	1050
F-2	HH-65	77	100%	1	77	77
F-3	USS PORT ROYAL	198	100%	1	198	198
F-4	KITTIWAKE	78.12	100%	1	78.12	78.12
F-5	C-130	1000	100%	1	1000	1000

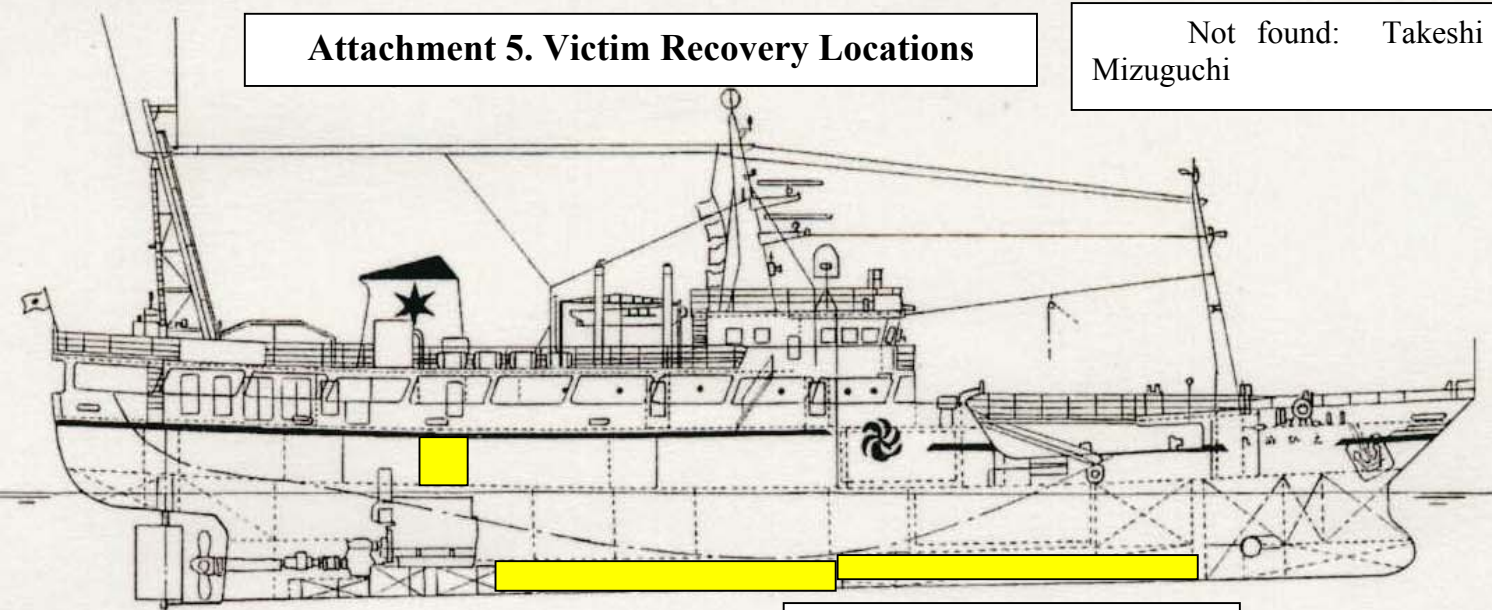
Search Areas E – February 13<sup>th</sup>

**Attachment 4 – Post-collision Chronology of February 9<sup>th</sup>**

<b>Time(W)</b>	<b>Event</b>	<b>Resource Description</b>
1343	Collision	
1348	Ehime Maru sinks	
1348	Greeneville bridge manned	
1348	Greeneville calls COMSUBPAC	
1355	COMSUBPAC call Gru Hono	
1356	Gru Hono diverts 6570 from patrol	6570 - USCG HH65A
1358	Gru Hono directs Sta Hono to get U/W	
1400	41317 and 216002 U/W	41317 - USCG 41' boat
1400	JRCC rcvd EPIRB alert	216002 - USCG 21' RHIB
1404	EPIRB ID'd as Ehime Maru	
1406	JRCC contacted Gru Hono	
1420	COMSUBPAC called JRCC	
1427	6570 on scene	
1431	216002 on scene	
1444	41317 on scene	
1445	6570 delivers rescue swimmer to 41317	
1445	Hawthorne 5 & 8 underway	Hawthorne 5 - USN 83' TWR
1446	6570 commenced VS	Hawthorne 8 - USN 97' TWR
1451	1714 diverted from training	
1505	JRCC assumed SMC	
1510	6570 departed scene due low fuel	
1522	6570 on deck for fuel	
1524	1714 on scene assumed OSC	
1538	41317 & 216002 departed scene with survivors	
1540	1710 inserts DMB	
1543	6570 airborne	
1556	6570 inserts DMB	
1615	41317 & 216002 returned Sta Hono	
1619	Assateague underway	Assateague - USCG 110' cutter
1647	Eagle 11 on scene	Eagle 11 - Navy P-3
1652	Easy Rider 51 on scene	Easy Rider 51 - Navy H-60
1656	Assateague on scene, assumes OSC	
1739	Assateague directed Hawthornes to recover rafts	
1750	JRCC told of Lake Erie & Salvor	
1846	6570 on deck for fuel	
1905	Salvor on scene	Salvor - USN salvage vessel
1916	6570 on scene	
1917	Easy Rider 60 on scene	Easy Rider 60 - Navy H-60
1924	Lake Erie on scene	Lake Erie - USN Cruiser
1935	1710 departed scene	
2019	6570 locates ELT on 121.5	
2100	Lake Erie assumes OSC	
2142	6570 on deck	
2210	Kittiwake on scene	Kittiwake - USCG 110' cutter
2220	Assateague departs scene	

## Attachment 5. Victim Recovery Locations

Not found: Takeshi Mizuguchi



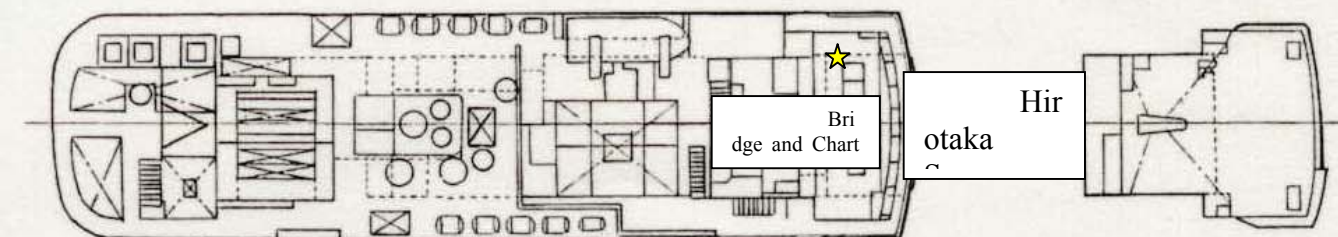
Location of Recovered



Location of Recovered

航海船橋甲板

コンパス甲板

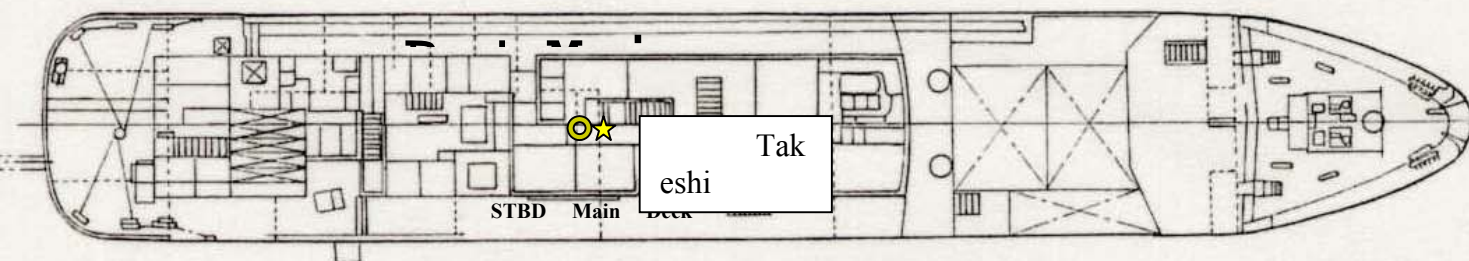


Bridge and Chart

Hir  
otaka

長船尾樓甲板

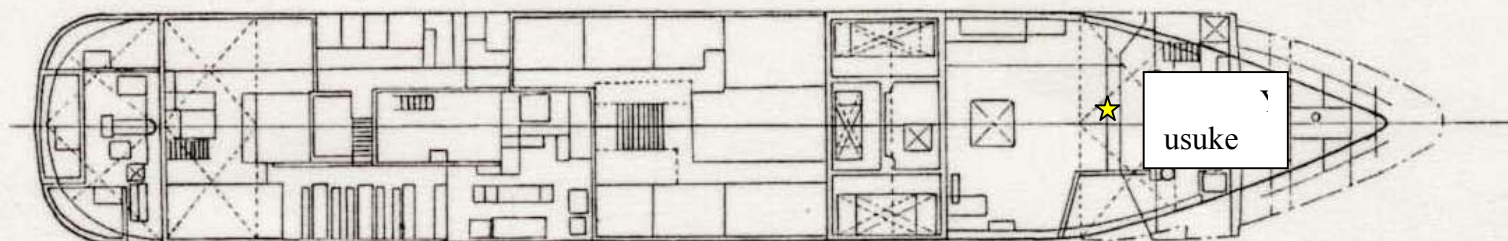
船首樓甲板



STBD Main Deck

Tak  
eshi

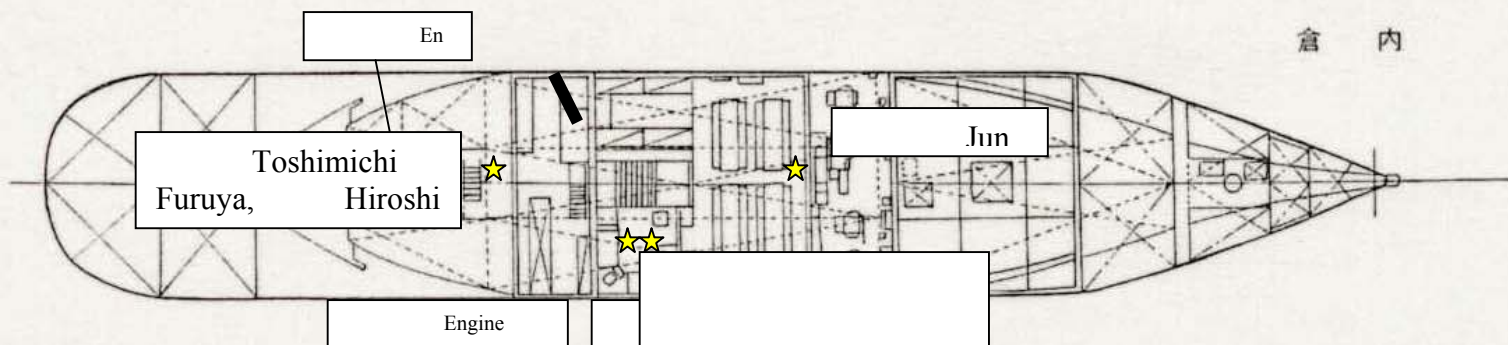
上甲板



usuke

En

倉内



Toshimichi  
Furuya, Hiroshi

Jun

Engine



## Attachment 6 Summary of Interviews with Ehime Maru Students

Nine students from the Uwnajima Fisheries High School were interviewed on 2/11/01 in the Ocean Resort Hotel, 175 Paoakalani Ave, Honolulu, HI. The nine were gathered together, given a general outline of the questions, and then individually interviewed. The nine students were:

<u>Name</u>	<u>age</u>
1) Yuta Sakamoto	17
2) Cyoichiro Yokoyama	17
3) Kiyoto Miyoshi	17
4) Shoji Tsuji	17
5) Atsushi Kamado	16
6) Yosuke Iketani	17
7) Manabu Matsushita	17
8) Daisuke Shinoto	16
9) Htroyuki Hosokawa	17

They had all begun the voyage on the *Ehime Maru* from Japan on January 8<sup>th</sup>. Most had been on the vessel once before for a short cruise. The students were studying primarily engineering, with the collateral of fishing.

Since leaving Japan, they had participated in drills on life jacket donning, mustering and abandon ship procedures. The life jackets were automatic inflatable vests and were stored near the individual bunks in the cabins.

The students had finished the noon meal 20 minutes before the collision.

The surviving students were all on the 2<sup>nd</sup> deck approximately amidships. Four were mess cooking in the crew's mess deck on the starboard side. The other five were in their cabins just forward of the mess deck.

The first indications of trouble were two loud noises and a shudder felt in the ship.

The students in their cabins described looking out into the passageway and seeing water and oil gushing up the stair well from below. Some students took life jackets from their cabins, some did not think to. They left their rooms and went aft in the passageway. The oil and water was ankle deep as they went.

The four students in the crews' mess went directly aft.

Most of the students went onto the main deck fantail area initially. Two reported seeing the submarine moving away from them on the port quarter. Most then describe moving individually towards their mustering stations on the 01 deck.

The ship was settling level at first, then went down by the stern. Several of the students went into the water or were washed off by the waves from the stern. The remaining students moved onto the top of the pilothouse, the next deck up.

Two were washed off the ladder as they climbed and the ship sank beneath them. The remainder were on top of the pilothouse as the ship sank. Several were initially pulled under by the suction of the ship sinking. They either swam to the surface or their life jacket automatically inflated and carried them up.

Those students who could estimate a time said the *Ehime Maru* sank in 5 minutes or less.

There were ship's life rafts in the area that had automatically released and inflated. All the students were able to easily swim to the rafts. They helped each other board several rafts. Most were suffering from oil ingestion and oil in their eyes. Several also complained of minor bruises or rashes.

The students saw the submarine approach them as they were in the rafts. They were pulled from the rafts by the rescue boats and taken to shore.

## **Attachment 7 Summary of Interviews with Ehime Maru Crew**

Interviewed were the following crewmembers:

Hisao Onishi	Captain
Ryoichi Miya	Chief Officer
Shuji Yanagihara	2 <sup>nd</sup> Officer
Sakichi Atsuta	2 <sup>nd</sup> Engineer
Shukuo Nakamura	Sailor
Masao Murai	sailor

The crew described similar experiences to the students in the egress from the Ehime Maru. The crew that were on the bridge (Capt, two sailors) did not see anything before feeling the impact. The ship was on autopilot on a southeasterly course at 11 knots. They were headed to an area about 300 miles south to begin fishing.

The bridge personnel saw the submarine after the impact on the port aft quarter. The Captain realized immediately the Ehime Maru was in trouble. He tried his radios but they would not work. The vessel had lost all power, including the backup systems. He had the Chief Radio Operator activate the Emergency Radio Beacon (EPIRB).

The Captain, Chief Mate, and a seaman on the bridge saw the Chief Radio Officer in the area of the bridge shortly after the collision. He was wearing an automatic inflating life jacket at that time. No one recalled seeing him leave the ship or in the water.

All the surviving crew were able to get into the life rafts that had automatically released as the ship sank. One crewman, the 2<sup>nd</sup> Officer, wound up in a raft by himself. The submarine approached him. They called out to him and he yelled back, but the language barrier prevented him from understanding what they said. He saw them put a Jacobs ladder down the side of the submarine's "house" (conning tower).

One of the seamen on the bridge described that immediately after the impact he saw the submarine on the port side of the ship. When he looked back forward, he saw diesel fuel squirting out of the fuel tank vent on the forward port side of the fishing deck.

Attachment 8 List of *Ehime Maru* personnel**Survivors**

Position	Name	Date of Birth	Interviewed	Address
Captain	Hisao Onishi 3	8/18/42	Y	
Chief Officer	Ryoichi Miya 5	8/25/42	Y	
2nd Officer	Shuji Yanagihara 7	3/3/52	Y	
2nd Engineer	Sakichi Atsuta 8	4/11/50	N	
No. 1 Oiler	Akira Kagajo ***	10/12/40	N	
Sailor	Takashi Nakamura	2/12/57	Y	
Sailor	Masalu Yamashita	7/13/74	Y	
Sailor	Hideo Okayama	10/26/47	Y	
Sailor	Shukuo Nakamura 9	7/11/41	Y	
Sailor	Tadanori Sato	8/31/56	Y	
Sailor	Tetsuo Hama	9/18/55	Y	
Sailor	Fumio Kogusuri	8/19/49	N	
Sailor	Makoto Hotta	1/22/77	Y	
Sailor	Masao Murai 9	8/2/49	Y	
Chief Steward	Hideaki Hamamoto	1/9/51	N	
Oiler	Yoshifusa Yamamoto	5/3/45	Y	
Oiler	Hidekatsu Kimura	7/19/56	Y	
Student	Yousuke Iketani	1/13/84	N	
Student	Atsushi Kamado	3/16/84	N	
Student	Yuta Sakamoto	11/28/83	Y	
Student	Daisuke Shinoto	2/26/84	Y	
Student	Syoji Tsuji	5/24/83	Y	
Student	Hirojuki Hosokawa	5/9/83	N	
Student	Kiyoto Miyoshi	6/19/83	N	
Student	Manabu Matsushita	8/5/83	N	
Student	Cyoichiro Yokoyama	7/3/83	Y	
*** Inpatient at Straub Hospital				

M1

**Missing**

Position	Name	Date of Birth
Chief Engineer	Toshimichi Furuya	4/19/53
1st Engineer	Hiroshi Nishida	12/12/51
Chief Radio Officer	Hiroataka Segawa	1/27/41
Teacher	Hiroshi Nakizawa	4/26/63
Teacher	Jun Nakata	6/8/67
Student	Toshiya Sakashima	4/13/83
Student	Yusuke Terata	4/4/83
Student	Katsuya Nomoto	9/6/83
Student	Takeshi Mizuguchi	2/7/84

## **Attachment 9 Chronology of Actions Onboard USS Greeneville Following the Collision**

From the interviews with the Executive Officer, Engineering Officer (EO), the First Lieutenant/bridge lookout (1<sup>st</sup> LT), the two divers, and an extract from the Greeneville's deck log the following sequence of events was developed. No specific time record was available. General times were established based on statements and interaction with events that were "time stamped". This covers the period from the point of collision to arrival of the first response assets on scene.

1343 - Collision. EO was in his stateroom and felt abnormal shudder as submarine reached surface

- EO proceeds immediately to the Control Room. The submarine is on surface, at all stop, and the Captain is looking through #2 periscope. The Chief of Staff then looks through the periscope.

- ED looks through the #2 periscope, sees the Ehime Maru settling by the stern. Describes the vessel's aspect as port 150. The stern is noticeably settling. When asked for the vessel's name, the stern is already under water. Reads the name on the side of the vessel. Sees the bulbous bow come out of the water.

- The 1<sup>st</sup> LT, divers, and hospital corpsman initiate the man overboard procedure, apparently in response to PA announcement.

1350 - Captain says "man the bridge". The EO was scheduled to be the bridge OOD for the transit into Pearl Harbor so he assumes the responsibility to take the watch. He also assessed the buoyancy of the submarine by looking at hull through periscope.<sup>20</sup>

- The EO and the 1<sup>st</sup> LT (lookout) proceeded to the bridge. The lookout brought with him a Jacobs ladder, which he rigged on the port side of the sail. The Ehime Maru had sunk, and life rafts were surfacing.

- The XO noted that the Hospital Corpsman was preparing medical supplies in the Wardroom and then went to the forward escape trunk access to check on the diver preparations.

- The EO assumed the deck and the con from the bridge. The outboard maneuvering motor had been rigged out and he used that and the main engine to circle to starboard back toward the life rafts and debris area. He directed the lookout to search for people in the water, and called to the control room to have personnel use the periscopes to also search for people in the water.

Before 1400 – The Captain (CO) came to the bridge carrying handheld VHF-FM radio. EO and CO discussed conditions on the main deck. Both agreed that the seas washing across the deck precluded use of forward escape trunk by divers.

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<sup>20</sup> Normal procedure was to pump more air into ballast tanks after emergency surface to increase buoyancy.

7/23/02

- The two senior divers were directed to come to the bridge. Four other divers stood by in the control room.

- Discussions on the bridge between the CO, EO, and divers resulted in the decision to put a diver in the water only if persons were seen in the water.

Before 1427 – The submarine approached two separate rafts. There was one person in each raft. Verbal communications could not be established because of language difficulties. Confused seas precluded using the submarine's hull to create a sheltered lee.

- The submarine was advised that Coast Guard helicopter and boat assets were enroute, estimate time of arrival 10 minutes.

1427 – Coast Guard helicopter arrived on scene. Coast Guard small boat seen approaching scene.